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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/050,529

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03/28/2005

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EXAMINER

TSE, YOUNG TOI

ART UNIT

PAPER NUMBER

2637

DATE MAILED: 03/28/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/050,529

Applicant(s)

GRAZIANO ET AL.

Examiner

YOUNG T. TSE

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2637

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 18 January 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-39 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-38 is/are rejected.
- 7) ☒ Claim(s) 39 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 18 January 2002 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 053002,052703.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Drawings

1. The drawings are objected to because Figure 1a does not show the connection or the relationship among the block elements 110, 112, 114 and 116 or the probe signals. In Figure 1b, block 128, "STUR" should be labeled "STUC". In Figure 1c, block 170, "STUC" should be labeled "STUR". In Figures 8 and 9, two figures are labeled together. Applicants are requested to label the figures separately, one for each figure. Also to correct the label of Figures 10 and 11 and also 21 and 22. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and

informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Specification

The disclosure is objected to because of the following informalities: on page 1, line 13 and page 21, line 25, "G.SHDSL" and "PAM" are undefined; in the brief description of the drawings from page 6 to page 8, the Applicants are requested to clarify how many aspects of the present invention are disclosed and they need to be specified in numerical order. For the formality of the application under the present office practice, applicant(s) is required to replace "Claims" with "I or We Claim", "The Invention Claimed Is" (or the equivalent) before the Claims part of the specification of the instant application. See MPEP 608.01(m). Appropriate correction is required.

2. The lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

Claim Objections

3. Claims 4-7, 10-15, 23-26, and 34 are objected to because of the following informalities:

In claim 4, lines 2 and 3, "a step" and "a transmit signal" should be "the step" and "the transmit signal", respectively.

In claim 5, lines 1 and 2, "a step" and "a noise signal" should be "the step" and "the noise signal", respectively.

In claim 6, lines 1 and 2, "a first power", "a second power", and "comprises" should be "the first power", "the second power", and "comprise", respectively.

In claim 7, line 2, "a power" should be "the power".

In claim 10, line 1m "a signal" should be "the signal".

Wherein claims 11-12 depend upon claim 10.

In line 1 of both claims 13 and 14, "a power" should be "the power".

In claim 15, line 3, "signal to noise ratio" should be "the signal to noise ratio".

In claim 23, line 4, "a transmit signal" should be "the transmit signal".

In claim 24, line 3, "a noise signal" should be "the noise signal".

Wherein claim 25 depends upon claim 24.

In claim 26, line 2, "a power" should be "the power".

In claim 34, line 2, "signal" should be "the signal".

Appropriate correction is required.

Claim Rejections - 35 USC § 112

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claims 9, 12, 16, 18-19, 28, 31, and 35 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The claimed subject matter of claim 9 is vague and indefinite because it is unclear what are the differences between the first and second modems and a plurality of modems? Further, the phrase "the steps" lacks antecedent basis since claim 1 recites three different steps; in other words, the Applicants are requested to specify exactly what are the steps for performing the claimed subject matter during a line probe session. Also see claim 28.

The claimed subject matter of claims 12 and 31 lacks connection or cooperation with other claimed elements or steps.

In claim 16 (line 2) and claim 35 (line 2), "G.SHDSL" is undefined.

In line 1 of both claims 18 and 19, the phrase "the steps" lacks antecedent basis. Applicants are requested to specify exactly what are the steps.

Claim Rejections - 35 USC § 102

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

7. Claims 1-6, 9-12, 16, 18-25, 28-31 and 35-38 are rejected under 35 U.S.C. 102(b) as being anticipated by Betts et al..

Betts et al. (U.S. Patent No. 5,475,711) discloses a channel capacity modulation system in Figure 1 comprising a first modem 110 and a second modem 120 for communication with each other over communication channels 101 and 102.

The second modem 102 comprises a signal-to-noise (SNR) circuit 200 performs a frequency dependent noise spectrum analysis from which frequency domain information of the noise signal is output by discrete Fourier transform techniques; a spectrum analyzer 300 provides information indicative of a frequency dependent amplitude response of the communication channel 101 without interrupting or affecting the data traffic through the modem 120. The first modem 110 includes a compute block 115 calculates the optimum boundary conditions of the communication channel 101 from the noise spectrum analysis and the frequency dependent amplitude provided by the modem 120. The compute block 115 alternatively may be located in the modem 120. See col. 3, lines 25-55 and col. 4, lines 15-40.

Figure 2 shows the detailed embodiment of the SNR circuit 200 of Figure 1.

Figure 3 shows the detailed embodiment of the spectrum analyzer 300 of Figure 1.

Figure 4 illustrates the operation of the channel capacity communication system with the desired functionality including criteria for the optimization process.

Figure 5 illustrates in greater detail some of the functions provided in the flow chart of Figure 4.

Figure 6 illustrates in greater detail some of the functions provided in the flow chart of Figure 5.

With respect to claims 1, 4-5, 10-12, 20, 23-24, and 29-31, the second modem 120 receives a signal from the first modem 110; determines the information conditions of the communication channels 101 or 102 associated with the first modem 110;

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calculates an estimate of channel capacity of a plurality of frequency domain sub-bands, for example, generates by an inverse discrete Fourier transformer in a transmitter circuit or a discrete Fourier transformer in a receiver circuit of the modem 110 or 120 (col. 1 lines 43-49 and col. 3, lines 49-55); and determines a data rate of the communication channel based on the estimate of channel capacity (col. 5, lines 34-67).

With respect to claims 2-3 and 21-22, the determination or estimation of the power backoff value or an estimated line loss is based on the calculated signal power, the noise power, and the signal and noise power by the SNR circuit 200 and the spectrum analyzer 300 shown in figures 2 and 3. See column 6, lines 21-23.

With respect to claims 6 and 25, the calculation of the noise signal and the transmit signal plus the noise signal of the discrete Fourier transformer is discussed in column 1, lines 44-49 and column 3, lines 49-55.

With respect to claims 9 and 28, the communication between the two modems 110 and 120 is performed during a line probe session. See col. 8, line 11-22.

With respect to claims 16 and 35, a modem operates according to the G.SHDSL standard for spectral compatibility is well known in the modem communications art.

With respect to claims 18-19 and 37-38, the communication of the modems 110 and 120 is communicated from a digital terminal equipment (DTE), which is well known to a person skill in the art, such as, a customer premise equipment or a central office. See col. 3, lines 29-31.

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

10. Claims 7-8, 13-15, 17, 26-27, 32-34 and 36 are rejected under 35 U.S.C. 103(a) as being unpatentable over Betts et al. in view of Richards et al..

Betts et al. discloses all the claimed subject matter as discussed in paragraph 7 above as applied to claims 1-2 and 20-21. However, Betts fails to show using the sub-band to optimally shape a spectrum for determining a power backoff value; shaping a spectrum such that at least one frequency with a signal to noise ratio value above a predetermined value is increasingly attenuated; shaping a spectrum such that at least one frequency associated with a signal to noise ratio value approximately equal to a predetermined threshold is minimally cut back; shaping a spectrum such that

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transmitted power is gradually increased with increasing frequency wherein signal to noise ratio is maintained substantially constant through a passband; and the power backoff value comprises a maximum power backoff value for a given bit error rate as recited in claims 7-8, 13-15, 17, 26-27, 32-34 and 36.

Richards et al. (U.S. Patent No. 6,571,089 B1) also discloses a related transceivers or modems shown in Figure 10 for communication with each other.

Richards teaches reducing the transmitter power of each radio to a level that produces satisfactory reception increases the total number of radios that can operate in an area without excess interference. See column 2, line 57 to column 3, line 2.

Richards teaches in narrow band embodiments, each pulse consists of burst of cycles usually with some spectral shaping to control the bandwidth to meet desired properties such as out of band emissions or in-band spectral flatness, or time domain peak power or burst of time attenuation. See column 6, line 62 to column 7, line 2.

Richards teaches lowering the output power of interfering transmitter reduces the extent to which interferences with the communication between transceivers 902A and 902B to maintain its output power to achieve a satisfactory signal reception. See column 14, lines 22-40.

Richards teaches the use of maximum data rate possible for the link range and interference conditions, keeping the power at the maximum. Thus power control would only be used where there is excess received signal at the maximum data rate available to the transceiver system. The transceiver is transmitting at its maximum data rate,

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power control could be used to decrease power so long as such a decrease in power does not cause the data rate to decrease. See column 33, line 55 to column 34, line 2.

Richards further teaches the transceiver shown in Figure 35 for use in an application control system and configured to measure signal strength, signal-to-noise-ratio (SNR), and bit error rate (BER) is illustrated. See column 38, lines 30-39.

Therefore, it would have obvious to one of ordinary skill in the art to shaping a spectrum such that transmitted power is gradually increased with increasing frequency wherein signal to noise ratio is maintained substantially constant through a passband in Betts transmitter of the modems as taught by Richards in order to backoff the power transmitted by the transmitter modem of the modems.

Allowable Subject Matter

11. Claim 39 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

12. The following is a statement of reasons for the indication of allowable subject matter: the prior art fails to show or suggest that the signal to noise ratio is calculated based on the equation (10) in the specification.

Conclusion

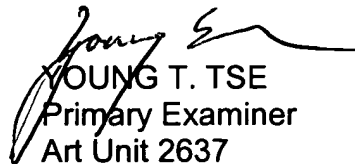
13. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

References Lomp and Tate et al. are made of record as describing a related method and apparatus for determining power backoff value of a first communication modem or a second communication modem through a communication channel.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to YOUNG T. TSE whose telephone number is (571) 272-3051. The examiner can normally be reached on Monday and Wednesday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jay Patel can be reached on (571) 272-2988. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


YOUNG T. TSE
Primary Examiner
Art Unit 2637